

AMENDMENTS TO THE SPECIFICATION

IN THE ABSTRACT OF THE DISCLOSURE:

Replace the Abstract of the Disclosure currently of record
with the attached new Abstract of the Disclosure.

BEST AVAILABLE COPY

IN THE TITLE OF THE INVENTION:

Please amend the title, as it appears on the first page of the specification and in the U.S. Patent and Trademark Office's website, as follows:

--~~INTERMEDIA~~ INTERMEDIATE LAYER FOR JOINING TWO PORTIONS OF A GOLF CLUB HEAD--

IN THE SPECIFICATION:

Please amend the paragraph beginning on page 3, line 5, as follows:

--Another object of the present invention is to provide an ~~intermedi-~~ intermediate layer for joining a head body and a hosel of a golf club head by friction welding, providing improved joining reliability for the hosel, improving adjusting range of the inclination angle of the hosel, and prolonging the life of a golf club head product.--

Please amend the paragraph beginning on page 3, line 10, as follows:

--A further object of the present invention is to provide an ~~intermedi-~~ intermediate layer for joining a head body and a weight member of a golf club head by friction welding, providing improved joining reliability for the weight member.--

BEST AVAILABLE COPY

Please amend the paragraph beginning on page 3, line 15, as follows:

--In accordance with an aspect of the present invention, a golf club head includes a first portion forming a part of a head body of the golf club head, a second portion forming another part of the head body of the golf club head, and an ~~intermedia~~ intermediate layer. The first portion, the second portion, and the ~~intermedia~~ intermediate layer are made of different materials. Each of the first portion and the second portion has an abutting portion, with the ~~intermedia~~ intermediate layer being positioned between the abutting portion of the first portion and the abutting portion of the second portion. The ~~intermedia~~ intermediate layer and the abutting portion of the first portion are joined together by ~~welding~~ friction welding, and the ~~intermedia~~ intermediate layer and the abutting portion of the second portion are joined together by ~~welding~~ friction welding, thereby forming a golf club head product.

Please amend the paragraph beginning on page 4, line 9, as follows:

--In an embodiment of the invention, the first portion is a head body, into the second portion is a hosel. The bonding strength and bonding reliability of the golf club head product are improved

by the ~~intermedia~~intermediate layer. Further, subsequent adjustment of the inclination angle of the hosel is convenient, and the life of the golf club head product is prolonged. In another embodiment of the invention, the first portion is a head body, and the second portion is a weight member.--

Please add the following paragraph after the paragraph ending on page 4, line 18:

--Further scope of the applicability of the present invention will become apparent from the detailed description given hereinafter. However, it should be understood that the detailed description and specific examples, while indicating preferred embodiments of the invention, are given by way of illustration only, since various changes and modifications within the spirit and scope of the invention will become apparent to those skilled in the art from this detailed description.--

Please add the following paragraph after the heading beginning on page 4, line 19:

--The present invention will become more fully understood from the detailed description given hereinbelow and the accompanying drawings which are given by way of illustration only, and thus are not limitative of the present invention, and wherein:--

Please amend the paragraph beginning on page 6, line 3, as follows:

--Referring to Fig. 3, a first embodiment of the golf club head in accordance with the present invention includes a first portion, a second portion, and an ~~intermedia~~-intermediate layer 40. In this embodiment, the first portion is a head body 10 made of a first metal material. A string plate 11 is formed on a front side of the head body 10 for striking a golf ball. A heel 12 is formed on a side of the striking plate 11, with an extension 13 extending upward from the heel 12 and having an abutting portion 131.--

Please amend the paragraph beginning on page 6, line 10, as follows:

--The second portion is a hosel 20 having an engaging hole 21 in an upper part thereof for engaging with a shaft 30. The hosel 20 further includes an abutting portion 22 formed at a lower part thereof. The hosel 20 is made of a second metal material. The ~~intermedia~~-intermediate layer 40 is made of a third metal material. The first metal material, the second metal material, and the third metal material are different from another. The metallurgical compatibility between the first metal material and the third metal material is better than that between the first metal material and the second metal material. Further, the

metallurgical compatibility between the second metal material and the third metal material is better than that between the first metal material and the second metal material. Given that the first metal material is different from the second metal material, each of the first metal material and the second metal material is selected from the group consisting of stainless steel, titanium alloy, carbon steel, low-alloy steel, cast iron, nickel-base alloy, structural steel, Fe-Mn-Al alloy, and super alloy. The third metal material is selected from the group consisting of niobium (Nb), chromium (Cr), aluminum (Al), iron (Fe), zirconium (Zr), titanium (Ti), vanadium (V), tantalum (Ta), ~~silver~~ silver (Ag), nickel (Ni), tungsten (W), and alloys thereof. The shaft 30 can be made of other metal material or a non-metal material, such as carbon fiber composite material.--

Please amend the paragraph beginning on page 7, line 8, as follows:

--Referring to Fig. 4 and 5, the head body 10 (the first portion), the ~~intermedia~~ intermediate layer 40, and the hosel 20 (the second portion) are joined together by friction welding. In assembly, a force F is applied to the head body 10 and the hosel 20 to make the abutting portion 131 of the head body 10, the ~~intermediate~~ intermedia-layer 40, and the abutting portion 22 of the hosel 20 abut against each other in sequence. Then, the

abutting portion 131 is turned relative to the abutting portion 22 and the intermediate ~~intermedia~~-layer 40. With the friction heat, the abutting portion 131 is joined to the intermediate ~~intermedia~~-layer 40.--

Please amend the paragraph beginning on page 7, line 16, as follows:

--Next, the abutting portion 22 (or the combination of the abutting portion 131 and the intermediate ~~intermedia~~-layer 40) is turned relative to the combination of the abutting portion 131 and the intermediate ~~intermedia~~-layer 40 (or the abutting portion 20). With the friction heat, the abutting portion 22 is joined to the combination of the abutting portion 131 in the intermediate ~~intermedia~~-layer 40. Thus, the head body 10, the intermediate ~~intermedia~~-layer 40, in the hosel 20 are joined together. A golf club head product is obtained after removal of residuals.--

Please amend the paragraph beginning on page 8, line 1, as follows:

--Referring to Fig. 4, since the intermediate ~~intermedia~~-layer 40 is made of a third material having a better welding compatibility with the abutting portion 131 made of the first material and the abutting portion 22 is made of the second material, the bonding strength of the two abutting portions 131 and

22 is improved via provision of the intermediate ~~intermedia~~-layer 40 between the abutting portions 131 and 22. Results of cannon shot tests showed that the head body 10 and the hosel 20 neither cracked nor broke after being shot not more than 1000 times (a golf ball with a standard weight hits the striking plate 11 of the head body 10 and velocity of 50 m/sec). The bonding strength and bonding reliability of the golf club head product are improved by the intermediate ~~intermedia~~-layer 40. Further, subsequent adjustment of the inclination angle A of the hosel 20 is convenient, the life of the golf club head product is prolonged.--

Please amend the paragraph beginning on page 8, line 13, as follows:

--The intermediate ~~intermedia~~-layer 40 can be formed in the shape of a tablet in advance. Alternatively, the intermediate ~~intermedia~~-layer 40 can be powdery or pasty or can be provided on the abutting portion 131 and/or the abutting portion 22 by electroplating or spraying. Further, the surface roughness of the abutting portion 131 and/or the abutting portion 22 is smaller than Ra 25 μ m, preferably smaller than Ra 6.3 μ m, and most preferably smaller than Ra 1.6 μ m. By this arrangement, when the abutting portion 131 and/or the abutting portion 22 abuts against the upper side of the intermediate ~~intermedia~~-layer 40 and/or the lower side of the intermediate ~~intermedia~~-layer 40, the oxidized layer (not

shown) on the contacting area is scraped with a surface roughness. Thus, ~~adverse affection effects~~ to the bonding strength and bonding reliability by the oxidized layer is avoided.--

Please amend the paragraph beginning on page 9, line 3, as follows:

--Figs. 6 and 7 illustrate a second embodiment of the present invention, wherein the abutting portion 131 of the head body 10 (the first portion) includes an annular wall 132 delimiting a space (not labeled) for receiving the intermediate ~~intermedia~~-layer 40 that is tablet-like, powdery, or pasty. Alternatively, the intermediate ~~intermedia~~-layer 40 is provided by electroplating or spraying. The annular wall 132 allows precise alignment between the head ~~body~~-body 10 (the first portion), the intermediate ~~intermedia~~-layer 40, and the hosel 20 (the second portion). After friction welding, the annular wall 132 can be kept or removed for proper surface finish, providing a golf club head product (see Fig. 5).--

Please amend the paragraph beginning on page 9, line 12, as follows:

--Fig. 8 and 9 illustrate a third embodiment of the present invention, wherein the abutting portion 22 of the hosel 20 (second portion) includes an annular wall 23 delimiting a space (not

labeled) for receiving the intermediate ~~intermedia~~-layer 40 that is tablet-like or pasty. Alternatively, the intermediate ~~intermedia~~ layer 40 is provided by electroplating or spraying. The annular wall 23 allows precise alignment between the head ~~body~~ body 10 (the first portion), the intermediate ~~intermedia~~-layer 40, and the hosel 20 (the second portion). After friction welding, the annular wall 23 can be kept or moved for proper surface finishing, providing a golf club head product (see Fig. 5).--

Please amend the paragraph beginning on page 9, line 21, as follows:

--Figs. 10 through 12 illustrate a fourth embodiment of the present invention, wherein the intermediate ~~intermedia~~-layer 40 is used to join the head body 10 (the first portion) and a weight member 50 (the second portion). The head body 10 includes a compartment 14 in an appropriate portion thereof (such as the bottom side of the head body 10). A bottom wall delimiting the compartment 14 forms an abutting portion 141, and the weight member 50 includes an abutting portion 51 on a side thereof. The intermediate ~~intermedia~~-layer 40 is tablet-like, powdery, or pasty. Alternatively, the intermediate ~~intermedia~~-layer 40 is provided on the abutting portion 141 of the compartment 14 by electroplating or spraying.--

Please amend the paragraph beginning on page 10, line 9, as follows:

--The head body 10 and the weight member 50 are joined together via the intermediate ~~intermedia~~-layer 40 by friction welding under the condition of applying a force F to the head body 10 and the weight member 50. A golf club head product (see Fig. 12) is obtained after removal of residuals on the weight member 50. In this embodiment, the first metal material is selected from the group consisting of stainless steel, carbon steel, titanium alloy, low-alloy steel, cast iron, nickel-base alloy, structural steel, Fe-Mn-Al alloy, and super alloy. The second metal material is a material having a specific density greater than 7.6 g/cm³ and selected from the group consisting of W-Fe-Ni alloy, tungsten alloy, molybdenum (Mo) alloy, and copper alloy. The material for the intermediate ~~intermedia~~-layer 40 is selected from the group consisting of niobium (Nb), chromium (Cr), aluminum (Al), iron (Fe), zirconium (Zr), titanium (Ti), vanadium (V), tantalum (Ta), ~~silver~~ silver (Ag), nickel (Ni), tungsten (W), and alloys thereof.--

**This Page is Inserted by IFW Indexing and Scanning
Operations and is not part of the Official Record**

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

- ☐ **BLACK BORDERS**
- ☐ **IMAGE CUT OFF AT TOP, BOTTOM OR SIDES**
- ☐ **FADED TEXT OR DRAWING**
- ☐ **BLURRED OR ILLEGIBLE TEXT OR DRAWING**
- ☐ **SKewed/SLANTED IMAGES**
- ☐ **COLOR OR BLACK AND WHITE PHOTOGRAPHS**
- ☐ **GRAY SCALE DOCUMENTS**
- ☒ **LINES OR MARKS ON ORIGINAL DOCUMENT**
- ☐ **REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY**
- ☐ **OTHER:** _____

IMAGES ARE BEST AVAILABLE COPY.

As rescanning these documents will not correct the image problems checked, please do not report these problems to the IFW Image Problem Mailbox.